

Management Review of Occupational Safety and Health, Environmental, Security and Self Assessment Management Systems

Ed Lessard

Ray Karol

Mel Van Essendelft

Dave Passarello

Joel Scott

Senior Managers, Group Leaders and Supervisors

**Collider-Accelerator Department
September 27, 2007**

Purpose

- **Annually senior C-A management shall review its environmental, occupational safety and health, and security performance, both qualitatively and quantitatively, for the purpose of identifying key improvement opportunities in these management systems**
- **C-A managers shall conduct an annual review of organizational performance versus objectives and measures defined in their self-assessment program**

Management Review Agenda

- **Ed Lessard – Objectives & Performance, EBIS & ERL, Costs – 20 m**
- **Dave Passarello – Audits, Arc Flash Labeling, NRTL – 20 m**
- **Ray Karol – Injuries, Tier 1, OSH/EMS Initiatives – 20 m**
- **Mel Van Essendelft – Environmental Performance - 15 m**
- **Joel Scott – Waste Reduction; Metal Recycling, UMC Plan – 15 m**
- **Senior Manager Evaluation and Record of Decision – 20 m**

Ed Lessard

- **Performance in FY07 on objectives and targets**
- **Status of EBIS and ERL accelerator authorization process**
- **ESH costs**

Environmental Objectives & Targets

- Increase the awareness of the BNL ESSH policy
 - Measure - # of workers checked vs. number aware of policy
- Improve internal controlled documents by centralizing location
 - Measure - # of test reports centralized
- Improve compliance at Satellite Accumulation Areas
 - Measure - # of RCRA non-compliances
- Increase the number of activated soil areas capped
 - Measure - Cap soil around HEBT water stops
 - Measure - Investigate if improved capping is needed at AGS
 - Measure – Results from tritium measurements in groundwater
- Increase the number of legacy waste items for disposal
 - Measure - Pounds of legacy waste removed from the site
- Achieve ISO 14001 re-registration
 - Measure – Registration

Some 2007 Practices Used to Implement EMS Objectives & Targets

- **Verified NESHAPs confirmatory air samples**
- **Re-communicated Satellite Area requirements to waste generators**
- **Conducted work observations of waste generators**
- **Evaluated EBIS and ERL programs for environmental compliance**
- **Reviewed data on activated soils with Radiation Safety Committee**
- **Reduced PCB containing devices at Linac and Building 912**
- **Implemented tritiated cooling-water reductions**
- **Implemented study for next tritiated water system upgrade**
- **Evaluated infiltration controls at soil caps**
- **...**

OSH Targets and Objectives for FY07

- Increase participation of managers in work observations
 - Measure - # of manager work observations
- Improve worker participation in Tier 1 inspections
 - Measure - # of workers participating in Tier 1 inspections
- Improve housekeeping
 - Measure - # of orderly storage areas observed by managers
 - Measure - # of orderly work spaces observed by managers
- Improve electrical engineer's knowledge of National Electrical Code
 - Measure - # of C-AD/SMD electrical engineers trained in NEC
- Improve arc-flash labeling with PPE listings on the label
 - Measure - # of label non-conformances at STAR and PHENIX
- Achieve an injury-free work year in C-AD/SMD as a whole
 - Measure - # of injuries in C-AD/SMD

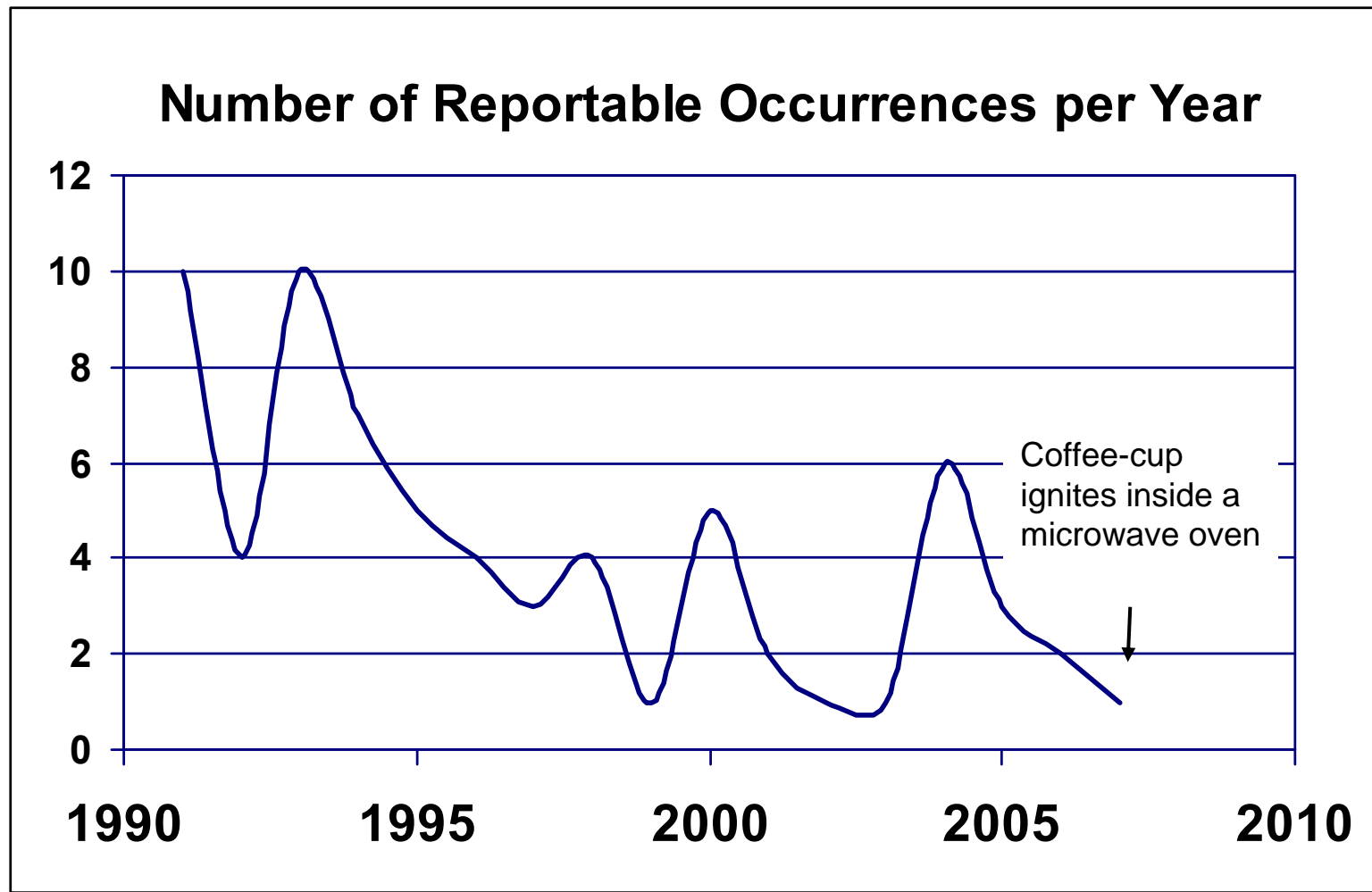
Some 2007 Practices Used to Implement OSH and Security Objectives & Targets

- **Many arc flash calculations and some labeling completed**
- **Metals inventory redone, valuable materials and owners identified**
- **Several inventories of valuable materials centralized and protected**
- **Baseline industrial hygiene monitoring measurements implemented**
- **ASME and NEC code training implemented**
- **First phase of Human Performance training for C-AD staff completed**
- **Fire Hazard Assessments completed**
- **Manager work observation procedure implemented**
- **Nationally Recognized Testing Laboratory program implemented**
- **Employees recognized for ESH improvements and given awards**
- **...**

Backward-Looking Performance Indicators

	2004	2005	2006	2007
Collective Dose (person-rem)	5.3	1.4	0.95	0.8
Skin and Clothing Contaminations	0	0	0	0
Internal Contaminations	0	0	0	0
Hazardous Material Overexposures	0	0	0	0
DART Rate (#/100 FTEs)	1.7	0.29	0.30	0.30
Number of Injury Cases	7	1	1	1
Recordable Rate (#/100 FTEs)	2.9	1.2	1.5	0.9
Number of Injury Cases	12	4	5	3
First Aid Cases Excluding Athletic	5	1	1	5
Occurrences	7	3	2	1

Occurrence Performance – Long Term



Backward-Looking Performance Indicators

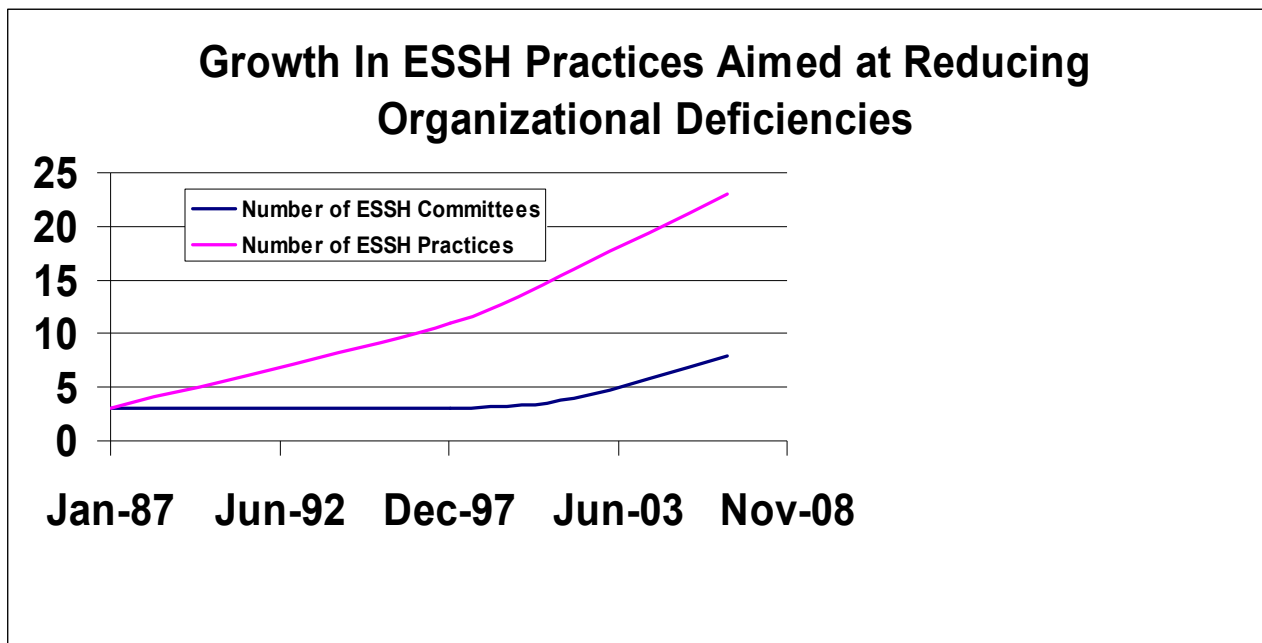
- **C-AD injury indicators are in the noise**
- **C-AD technical indicators are declining:**
 - **Part 851 Code deficiencies ↓**
 - **Occurrences and environmental non-compliances ↓**
 - **Radiation exposure ↓**
- **Backward indicators do not measure organizational deficiencies:**
 - **Failure to maintain and modernize critical equipment**
 - **Operations pressures**
 - **Cost-cutting in maintenance, training, personnel**
 - **Management commitment**
 - **Worker involvement**
 - **Line accountability for injuries**

Looking Back at Commercial Nuclear Performance on Significant Events

- **80% of events due to human error**
- **Greatest contributor to costs**
- **70% of causes due to organizational deficiencies**

- **We are not measuring our organization's efforts to reduce organizational deficiencies**

Possible Forward-Looking Performance Indicator



EXAMPLE PRACTICES:

- Safety Meetings
- WOSH Committee
- Disciplinary Rules
- Work Planning
- Safety Surveys/Feedback
- Self-Assessment
- Manager Work Observations
- Management Review
- 3rd Party Registrations
- Security Committee
- Annual Objectives and Targets
- Human Performance Training
- User Training
- Fire Hazards Analyses
- Critiques
- Code Training

- Best safe companies have 25 to 40 practices
- Practices may change/improve with time

Manager Work Observations

- **Started summer of 2006**
- **Directorate-wide program**
- **C-AD OPM and Tickler Card in place**
- **Performed 10 or more times per year**
- **23 work observations completed in FY07**
 - **11 at C-AD**
 - **6 at SMD**
 - **3 at Instrumentation**
 - **2 at Physics**
- **Managers committed to doing 3 to 4 per year**

Common Findings in Manager Work Observations

- **Use of PPE not clear or not worn**
- **Storage areas have unnecessary items**
- **Items piled high on shelves or in aisle ways**
- **Poor lighting**
- **Noteworthy practice: managers get feedback from workers**

2007 ESH Summary for EBIS

- **Safety reviews and authorizations to date are on time**
 - NEPA process completed
 - Preliminary Hazard Analysis / Hazard Screening Report completed
 - Fire Hazard Analysis completed for Building 930
 - C-AD Safety Committees reviews are in progress
 - Unreviewed Safety Issue document is in preparation
 - Modifications to Accelerator Safety Envelopes are in preparation
- **2008 to 2010**
 - BNL ESH Committee Review of new USI and ASE modifications
 - BNL Pressure Safety Committee Review of SC Solenoid
 - BNL approval of USI
 - BNL Accelerator Readiness Review
 - DOE approval of ASE modifications
 - DOE Commissioning/Operations Authorization

2007 ESH Summary for ERL

- **Safety reviews and authorizations to date are on time**
 - NEPA process completed
 - Preliminary Hazard Analysis / Hazard Screening Report completed
 - Fire Hazard Analysis completed for Building 912
 - C-AD Safety Committees reviews are in progress
 - Safety Analysis Document is in preparation
 - Accelerator Safety Envelope is in preparation
 - Conduct of Operations Document is in preparation
- **2008 to 2010**
 - BNL ESH Committee Review of SAD and ASE
 - BNL Pressure Safety Committee Review of SC RF
 - BNL approval of SAD
 - BNL Accelerator Readiness Review
 - DOE approval of ASE
 - DOE Commissioning/Operations Authorization

ESSHQ Costs

- **SMD ESH costs not included at this time**
- **Costs do not include the cost of fixing the plant except:**
 - **Tritiated water-system upgrades**
 - **Security improvements for valuable metals**
- **Waste management is the major expense**

FY07 ESSHQ Management Systems Maintenance

▪ OSH and environmental records	0.2 FTE
▪ Corrective action tracking	0.5 FTE
▪ Procedures	0.5 FTE
Total	1.2 FTE

FY07 ESSH Projects

▪ Tritiated water-system upgrades*		\$0
▪ Safety equipment (PPE, TLDs, ...)		\$400,000
▪ ASME and NEC Code Training		\$40,000
▪ Human Performance Training		\$25,000
▪ Security improvements	0.25 FTE	\$30,000
▪ NRTL Program	0.75 FTE	\$0
▪ Arc Flash Calculations		\$224,000
• Labeling		\$5,000
▪ Fire Hazards Analysis		\$90,000
Totals	1.0 FTE	\$794,000

***~\$200k remains; evaluating best application of funds**

FY07 Waste Costs

- **Legacy HEP Waste Management**
 - **YTD Expense (9-30-07)** **\$740,000**
 - **G&A** **\$95,000**
 - **Commitments at year end** **\$34,000**
 - **G&A** **\$3,000**
- **C-AD Waste Management**
 - **YTD Expense (9-30-07)** **\$183,000**
 - **G&A** **\$58,000**
 - **Commitments at year end** **\$44,000**
 - **G&A** **\$6,000**
 - **Waste Management Allocation** **\$1,411,000**
 - **G&A** **\$440,000**

Total

\$2,142,000

Fines/Violations

- None

FY07 Injury/Illness/Theft Costs

- **Direct costs of \$5,000 for injuries in FY07**
 - DART Head injury 10/10/06 = \$4,686
 - TRC eye injury 6/25/07 = \$213
 - TRC finger injury 11/27/06 = \$0
 - First aid eye injury 7/3/07 = \$117

 - One athletic injury = \$635
 - Exacerbation of pre-existing back injury 8/1/07 = \$9000 billed...case still open
 - Exacerbation of pre-existing knee injury 2/6/07 = \$161
- **\$82,000 (FY04), \$26,000 (FY05), \$6,500 (FY06)**
- **Thefts of metals, \$0**

FY07 OSH and E Monitoring

▪ Groundwater sampling and analysis	0.2 FTE	\$68,000
▪ g-2 geoprobes		\$40,000
▪ OSH baseline measurements	1.0 FTE	\$20,000
Totals	1.2 FTE	\$128,000

FY07 Backward-Looking Practices

▪ Performance indicator program	0.1 FTE
▪ Critiques	0.1 FTE
▪ Injury/Illness investigations	0.1 FTE
▪ Occurrence and critique investigation	0.2 FTE
▪ Tier 1, Work Observations, Safety Walks	2.0 FTE
▪ NSF, ISM and other audits	1.0 FTE
▪ Internal OSH / EMS Audits	0.5 FTE
Total	4.0 FTE

FY07 Forward-Looking Practices

▪ Management Review	0.1 FTE
▪ WOSH Committee	0.1 FTE
▪ OSH/EMS Team	0.3 FTE
▪ ASSRC, RSC, ALARA, ESRC reviews	0.3 FTE
▪ Job and facility risk assessments	0.2 FTE
▪ Environmental process evaluations	0.1 FTE
▪ OSH/EMS training	0.1 FTE
Total	1.2 FTE

FY07 Technical Support

▪ Environmental Coordinator	0.5 FTE
▪ Environmental Compliance Representative	1.0 FTE
▪ Hazardous Waste Technician	0.7 FTE
▪ Work Control Manager	0.5 FTE
▪ ESH and Tier 1 Coordinator	1.0 FTE
▪ Training Coordinator	1.0 FTE
▪ Radiological Control Techs and Supervisor	7.0 FTE
▪ Facility Support Representative	1.0 FTE
Total	12.7 FTE

FY07 ESSHQ Cost Summary

	FTE	Other Expense
▪ Management Systems Maintenance	1.2	-
▪ ESSHQ Projects	1.0	\$794,000
▪ Waste Costs	-	\$2,142,000
▪ Fines/Violations	-	\$0
▪ Injury/Illness	-	\$5,000
▪ Monitoring	1.2	\$128,000
▪ Backward-looking Practices	4.0	-
▪ Forward-looking Practices	1.2	-
▪ Technical Support	12.7	-
▪ FY07 Totals	21.3	\$3,069,000
▪ FY06 Totals	27.2	\$3,072,000
▪ FY05 Totals	18.2	\$3,731,000
▪ FY04 Totals	18.9	\$3,796,000

Estimate of ESSH costs, FY07, Magnet Division					
P. Wanderer 10-15-2007					
Using slides 18-28 from Ed Lessard's talk of late Sept as the framework.					
items in Ed's slides not listed here were N/A to Magnet Division					
slide #	item	FTE	\$		
19	OSH	0.1			
	Corrective	0.1			
	Procedures	0.1			
	TOTAL	0.3			
20	safe equip		10,000		
	code train		2,000		
	security		1000		
	NRTL	0.1			
	arc flash labels		500		
	TOTAL	0.1	13,500		
21	waste mgmt		10,000		
	TOTAL		10,000		
22	finer		0		
23	injury ...		0		
24	OSH meas	0.1	2,000		
	TOTAL	0.1	2,000		
25	Tier I	0.1			
	ISM	0.1			
	Internal	0.1			
	TOTAL	0.3			
26	Mgmt revu	0.1			
	WOSH	0.1			
	TOTAL	0.2			
27	work ctrl coord	0.1			
	ESH coord	0.1			
	FSRep	0.2			
	TOTAL	0.4			
28	TOTAL	1.4	25500		

Dave Passarello

- **Security**
- **PPE Labeling & NRTL Inspection Status**
- **Assessments**
- **Questions answered**
 - **What were the internal assessments?**
 - **What were the external assessments?**
 - **What are results?**
 - **How are findings dispositioned?**

Material Security

- **What were the drivers?**
 - **Two copper incidents**
 - **Security Assistance Report issued by DOE Chicago (at our request)**
- **Significant actions**
 - **Consolidating target of theft material into fewer locations**
 - **Improving security measures throughout facility**
 - **Increased communication between C-A and Police**
 - **Improving database of C-A valuable material**
 - **Improved key control program**

PPE Labeling & NRTL Inspection

- **ARC Flash PPE Labeling Program**
 - **ARC flash category calculations being performed**
 - **Category 2 & 4 breakers/disconnects labeling (high hazard)**
> 99% complete with specific PPE label
 - **Category 0 (BNL 0+) breakers/disconnects labeling (low hazard)**
> 99% complete but many labels only indicate “Arc Flash Hazard”
 - **PPE requirements to be posted upon completion of calculations**
- **NRTL Inspection Status**
 - **≈ 15,000 pieces of equipment within C-AD**
≈ 4500 BNL built
 - **Currently inspected: 5944 in database**
3595 BNL built

FY07 Self Assessment Program

Objective: Provide a systematic approach to performance management

- **Identifies EMS/OSH/QA and facility performance objectives**
- **Facilitates tracking of identified improvement actions**

FY07 Internal Assessments

▪ Critiques (including ad hoc reviews)	13
▪ QA Assessments	10
▪ Management Walk Around	11
▪ Tier 1	36
▪ Worker and Supervisor Self-Evaluations	2
▪ Safety Walks	7
▪ Outdoor Storage Areas	4
▪ Inspection of Satellite-Waste Stations	12
▪ Tank Inspections	12
▪ 90-Day Area Inspection	<u>52</u>
Total	159

FY07 Required BNL Program Assessments

C-A required to assess implementation of the following BNL programs:

- **Internal Controlled Documents and Records**
- **Lock-Out / Tag-Out**
- **Interlock Safety for Protection of Personnel**
- **Regulatory Compliance**
- **EMS**
- **OSH Management System**

FY07 External Assessments

BNL

- **Calibration program review**
- **Conduct of Operations review**
- **ISM readiness review**
- **Independent review of all administrative and engineered controls**
 - **Ensured interlocks, procedures, shielding, etc. were in place**
 - **Needed to do this to close out the Arc Flash Occurrence**

NSF

- **ISO 14001 surveillance audit**
- **OHSAS 18001 surveillance audit**

FY07 External Assessments

DOE

- **ISM**
- **Security**

BHSO Independent Assessments

- **Laser Safety Program**
- **Engineering Design**
- **Material Handling**
- **Radiation Protection**
- **Contractor Assurance**

BHSO Verification/Validation Reviews

- **Electrical Safety**

Status of Action Items

- **Internal (Family ATS)**
 - **Issued** 944
 - **Percent Closed** 61%

- **External (Institutional ATS)**
 - **Issued** 60
 - **Percent Closed** 60%

Closeout Process for Assessments

- **Action items assigned to accountable individuals**
- **Internal action items entered in Family ATS**
- **External action items entered in Institutional or Family ATS**
- **Closeout requires concurrence of C-AD ESSHQ Management**

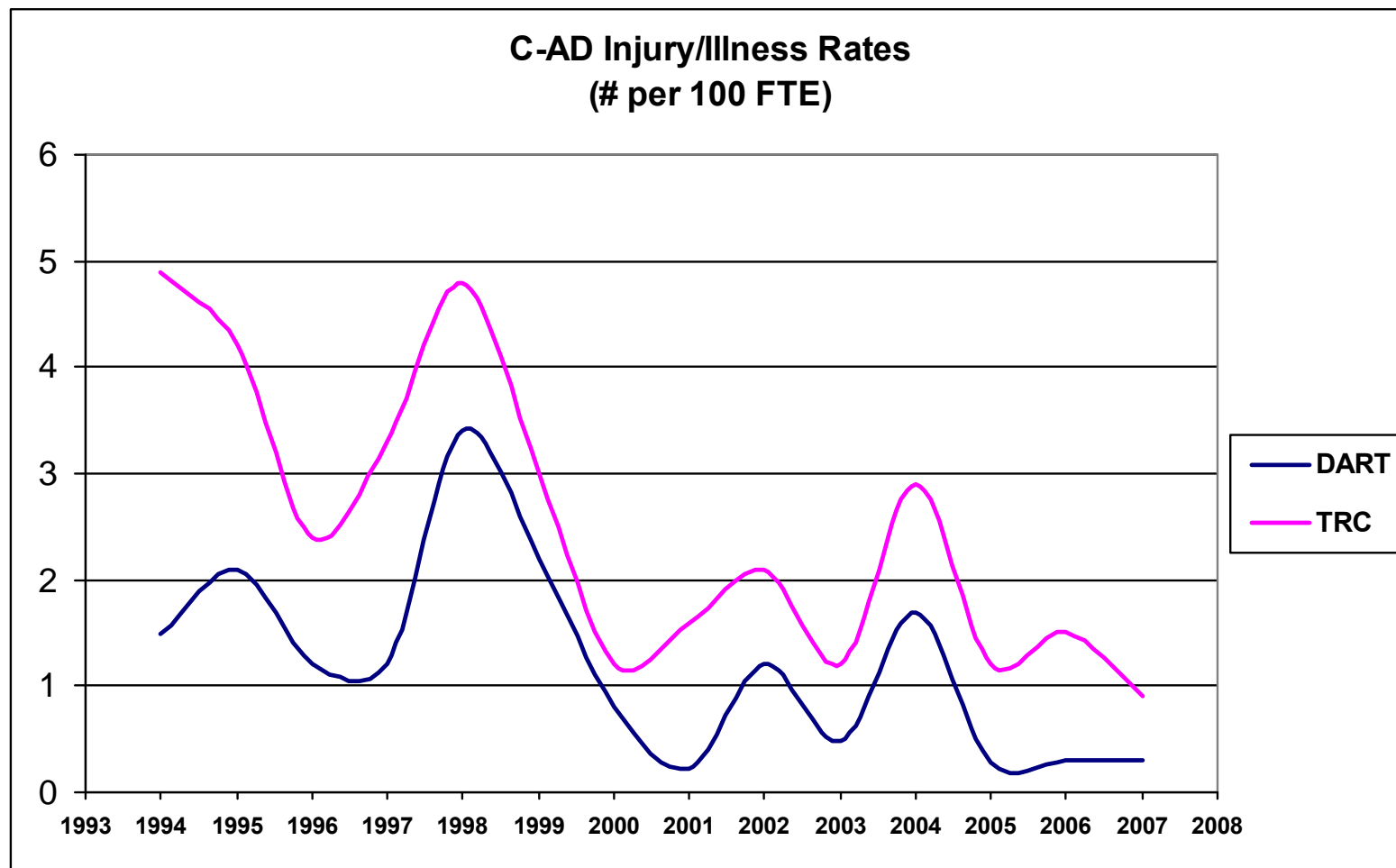
Ray Karol

- **Illness/Injury performance**
- **Stakeholder concerns**
- **Major OSH/EMS improvements**
- **S2 initiatives**
- **Tier 1 tracking and trending**
- **10CFR851 compliance issues**
- **Radiological performance**

Occupational Injuries in FY07

Organization	DART Rate per 100 FTE <i>BNL Goal <0.25</i>	TRC Rate per 100 FTE <i>BNL Goal <0.65</i>
C-AD	1 case <i>0.3</i>	3 cases <i>0.9</i>
BNL	22 cases <i>1</i>	41 cases <i>2</i>

C-AD DART and TRC Rates



C-AD Days Away Restricted Duty (DART)

1 Case in FY 07

- **Prior to this DART we went 642 days without a DART**
- **FY07 DART Case - Bookshelf fell, caused laceration of forehead**
 - **DART due to lost work**
- **Currently have 351 days without a DART**

C-AD Recordable Cases

3 Cases in FY 07

- 1. Bookshelf DART case**
- 2. Cut hand on sharp edge of waste can, antibiotics given**
- 3. Dirt from air conditioner floated into eye, antibiotics given**

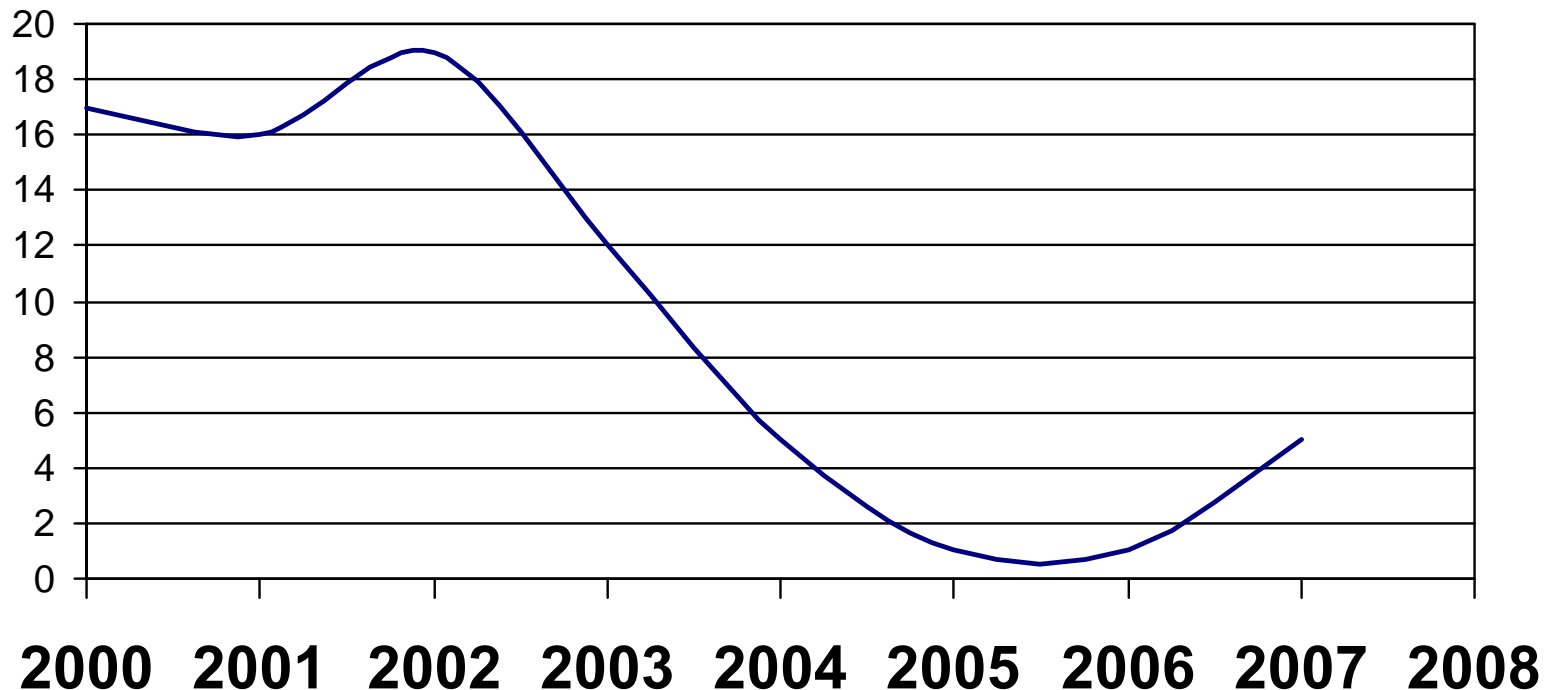
C-AD First-Aid Cases

5 First-Aid Cases in FY 07

- **Bruise from walking into stanchion**
- **Stood up and hit head on metal tank**
- **Cut finger on metal shelf**
- **Cut finger on tie wrap**
- **Cut arm on door-latch strike-plate**

First-Aid Cases

First-Aid Injuries Excluding Athletic Injuries



Stakeholder Concerns

- **Community**
 - g-2 tritium plume
- **Regulators**
 - g-2 tritium plume
 - 10CFR851 regulations
 - ISM assessment
- **Activists**
 - None

Major OSH/EMS Improvements

- **Electrical upgrades**
 - **Replaced high risk GE Spectra switches**
 - **Arc flash calculations continue**
 - **Posted areas with required PPE for HC 2 and 4 switches / breakers**
 - **Removed many old cables and cable tray**
 - **Improved many supports for existing cable tray**
 - **Removed many old Royal switches in B912**
 - **Replaced many old switchboards and panel boards**

Major OSH/EMS Improvements

- **Electrical upgrades continued**
 - **High resistor grounds installed at substations**
 - Prevents possibility of oscillating arcing to ground
 - **Disconnected equipment that was subject to water damage in B912**
 - **Replaced lighting panels in B912 that had exposed bus inside**
 - **Began program to inject primary current into breakers**
 - Used to verify breaker trip points and delays
 - **Improving maintenance of switches and MCC buckets**

Major OSH/EMS Improvements

- **Human Performance training for managers, supervisors and workers**
- **NEC training for Electrical Engineers**
- **ASME Section VIII, Division 1 training for Mechanical Engineers**
- **Training scheduled for FY08:**
 - **NEC 2008**
 - **ASME B31.3, Process Piping Code**
 - **ASME Section VIII, Division 2**
 - **Pressure Vessel Repair and Alterations**
 - **Complete staff Human Performance training**

Major OSH/EMS Improvements

- Continued with PCB capacitor reduction
- Major cleanup of old buildings and trailers
- Drained and refilled water systems to reduce tritium concentrations

Water System	Final H-3 Concentration	Reduction
F-10 System	2,150 pCi/L	55%
SEM System	740 pCi/L	91%
Linac RF	1,310 pCi/L	79%
RFMG Cavity	119,000 pCi/L	40%
Fast Pulse Quad	1,220 pCi/L	96%
AGS MM	Expect < 150,000 pCi/L	Expect >50%

FY07 Safety Solutions (S2) Proposals

- **One submitted for sidewalk from B911 to Physics building**
 - **Not funded (~\$20K)**
 - **BNL only had \$10K in S2 funds**

- **C-AD purchased 2 more AEDs (~\$3K each)**
 - **B911**
 - **B930 - Linac**

C-AD Tier 1

- **Tier 1 inspections are similar to OSHA inspections**
- **Weekly Tier 1 inspections cover over 110 buildings**
- **Findings tracked in ATS**

- **Reports distributed after inspection to C-AD staff; available to BNL**
- **Findings assigned to responsible individual**
- **36 Tier 1s conducted in FY07**

C-AD Tier 1

- **All Facility Use Agreements for C-AD were updated this FY**
- **This year F&ES Section demolished:**
 - **7 portable houses**
 - **13 trailers**
 - **1 cooling tower**
- **This year C-AD vacated the following buildings:**
 - **B952**
 - **B938**
- **The EBIS at B930 addition was just completed**

C-AD Tier 1 – Improved Housekeeping



Building 922

C-AD Tier 1 – Improved Housekeeping



Building 911

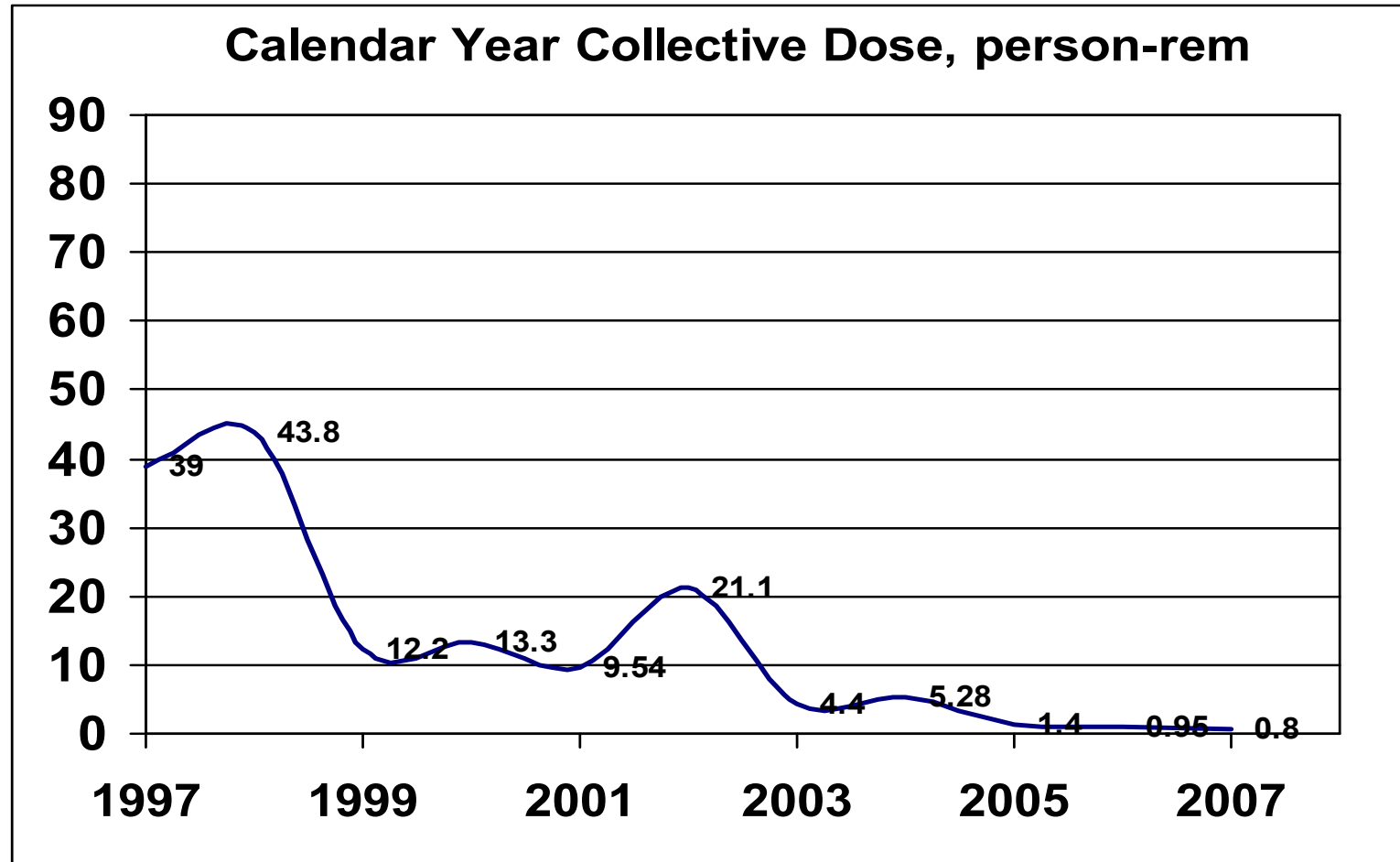
C-AD 10CFR851 Compliance Issues

- **Improve C-AD compliance with SBMS construction safety**
 - OPM being written followed by training
- **Complete/maintain posting of loads on power distribution panels**
- **Fund 123 Fire Hazard Analyses recommendations (ADS and FWP)**
- **Others are lab-wide compliance issues**

Ionizing Radiation Dose Equivalent

- **FY07 collective dose** **800 person-mrem**
- **Maximum individual dose** **57 mrem**

Comparison with Prior Years



Mel Van Essendelft

- **EMS Assessments**
- **Environmental Monitoring & Performance**

FY07 EMS Assessments Specific to C-AD

- **C-AD Assessment: 0 Findings, 1 Observation**
 - **Self-Assessment Plan not issued at time of audit**
- **BNL Assessment: 0 Findings, 2 Observations, 1 Noteworthy Practice**
 - **FY06 SMD Management Review not completed until 1/30/07**
 - **C-AD Management Review did not show SMD cost breakdown**
 - **C-AD EMS website well-designed with excellent links**
- **NSF Assessment: 0 Findings, 0 Opportunities For Improvement**

Compliance Audits (Multi-Topic Assessment)

- **Currently in-process**
- **Reduced in scope**
- **Areas for C-AD and SMD include:**
 - **Storage and handling of hazardous and non-hazardous materials**
 - **Recharge basin HT-E contaminant sources**

Environmental Monitoring FY07

- **Wastewater Discharge to Outfalls – 0 Exceedences**
- **Water Quality Results for Recharge Basins - 1 Exceedence**
- **Radiological Results for Recharge Basins – 0 Exceedences**
- **Skyshine Results**
 - **C-AD areas and buildings \leq 25% over background**
- **Groundshine/Shieldshine Results**
 - **50 mrem outside J-Superperiod (not occupied)**
 - **All other areas \leq 10 mrem**

C-AD/SMD

Spill Performance

- **C-AD had one reported spill for CY 2007**
 - **Failure of hydraulics on lift gate truck**
- **SMD had zero reported spills for CY 2007**

Executive Order 13423: Pollution Prevention Mandates for 2008-2010

New areas or goals we must address:

- **Energy and water management**
- **Acquisition and green product designations**
- **Sustainable design/high performance buildings**
- **Electronics stewardship**

White House Closing the Circle Award for Environmental Stewardship

- **What BNL accomplished:**
 - **40% reduction in the site-wide inventory of mercury**
 - **90% reduction in the onsite inventory of PCBs**
 - **35 ton reduction in Class I Ozone Depleting Substances**
 - **34% reduction in atmospheric emission of radionuclides from BLIP**
 - **Recovery of 42 acres for restoration as viable forest**
 - **101,400 pounds of electronics recycled**

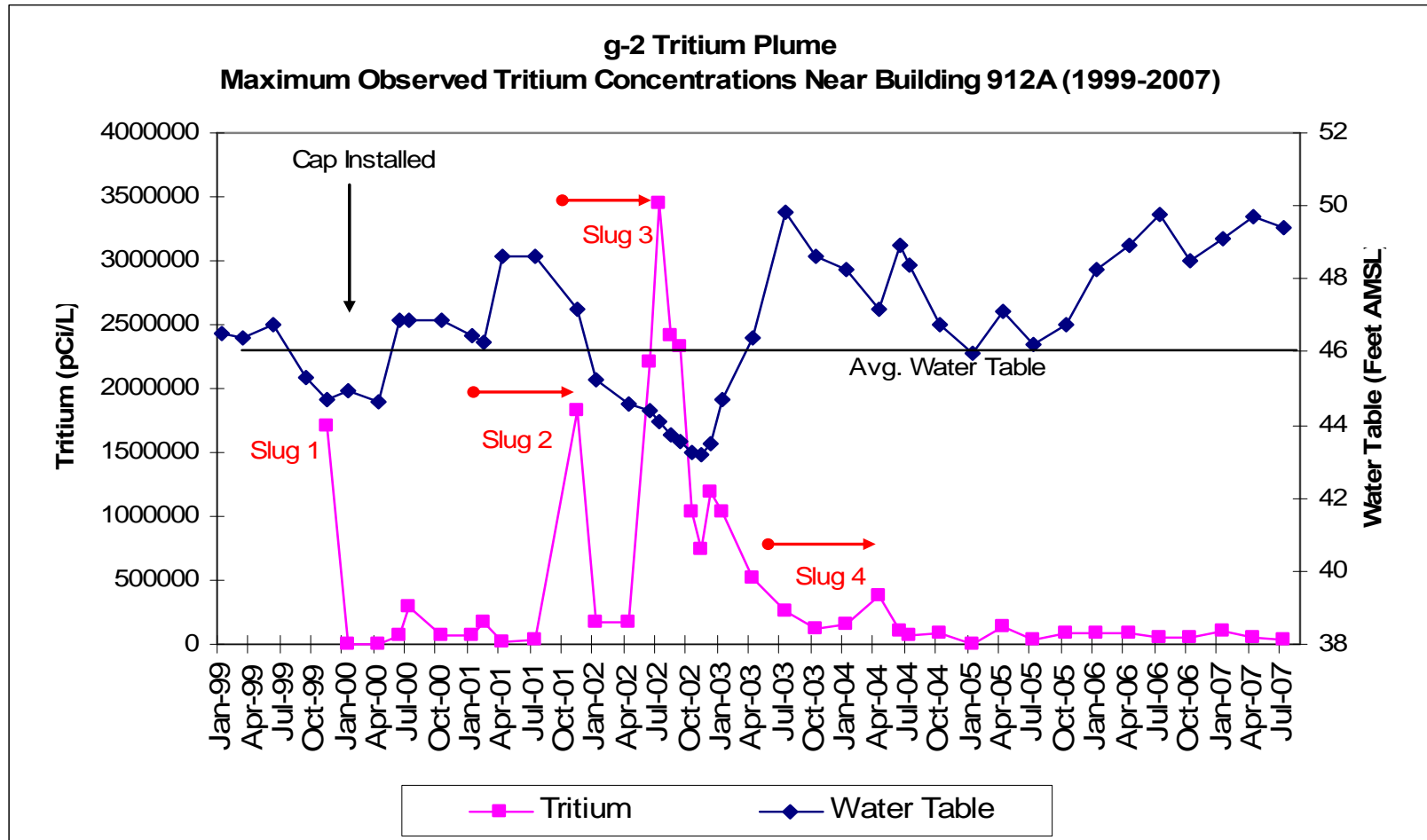
End of FY06 Run - Soil Sample Results

- **Sampling confirms need to cap HEBT area**
- **Uncapped 1006 collimator results remain low**
- **Additional samples placed in J-10 areas**

Well Sampling Program Costs (For Permanent Wells)

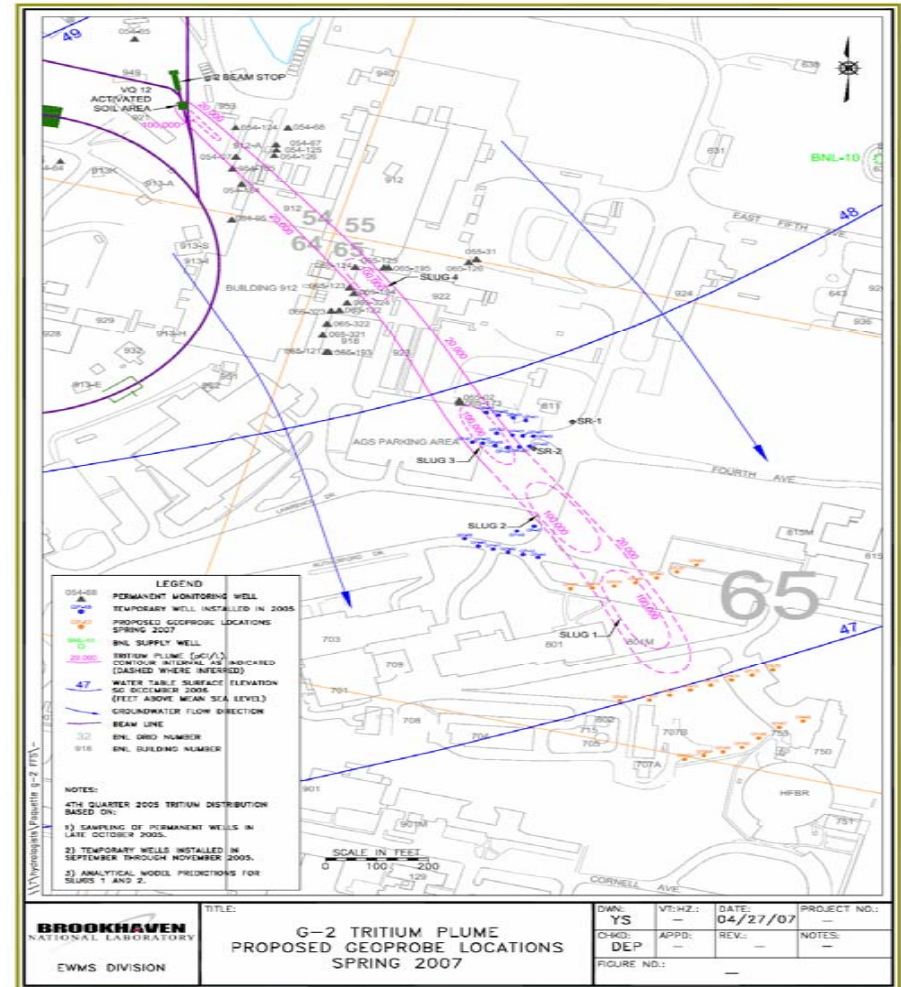
FY	Cost
03	\$72,600
04	\$65,900
05	\$69,900
06	\$56,000
07	\$61,600
08	\$67,600 (Estimated)

g-2 Tritium Plume



Position of g-2 Plume

- Located more than one mile north of the BNL southern Boundary
 - June 25 to July 3 - installed three wells, maximum concentration was 198,000 pCi/L
 - This is part of Slug 2 and has traveled 1600 ft.
- Current plume movement consistent with modeling
- Based on current dissipation, plume could be less than Drinking Water Standard when it reaches NSLS



Joel Scott

- **Routine Waste**
- **Waste Minimization**
- **Legacy Waste Efforts**
- **Unneeded Materials and Chemicals**
- **Future Legacy Waste Efforts**

Routine Waste

Waste Category	Actual	Comments
Hazardous/Industrial – Lab Pak	2000	OSHA driven cleanups Below allocation estimate
Hazardous/Industrial - Barreled	30,000 lbs	On allocation, 20,000 lbs were PCB capacitors from Linac
Low-level Radioactive – Solid	11000 ft ³	On allocation 9000 ft ³ of legacy waste
Mixed Radioactive and Hazardous	10 ft ³	Below allocation
Low-level Radioactive – Liquid	150 gal	Below allocation

Waste Minimization P2 Savings

- **Sorting waste bags**
 - Saved \$5,000
- **Bulb crusher for activated lights**
 - Saved \$20,000
- **Decay in storage of air filters**
 - Saved \$7,500
- **Can crusher**
 - Saved \$2,000
- **Propane Cylinder De-valver**
 - Saved \$7,100
- **Total savings \$42,000**



NP/HEP Supported Legacy Waste Efforts

- 4 railcars of *legacy* components and soil
 - 200,000 lbs, magnets and booster dump
 - 220,000 lbs of shield block
- LINAC
 - Removed last large capacitors to waste
 - Removed 1300 of the small caps
- Siemens
 - Complete removal of all PCB caps
 - By end of shutdown
- 912
 - Removed 355 PCB caps
- Chemical cleanups in 922, 923, 930 and 912



Unneeded Materials & Chemicals

- Waste efforts concentrated on the UMC list developed in FY06
- C-AD listed ~\$2,000,000 of unneeded materials and chemicals
- All future legacy waste plans will focus on this list
- C-AD has completed removal of 95% of 2007 listed items
- C-AD has completed 35% of 2008 listed items

Future Legacy Waste Efforts

- **Complete removal of all PCB capacitors**
 - LINAC will finish by end of 2008 shutdown
 - Siemens will finish by end of this calendar year
 - 912 will complete removal this year
 - 901 TANDEM needs funding to purchase PCB cap replacements
 - Above actions entirely removes PCB caps from C-AD
- **Continue with FES Division cleanup of 912**
- **Continue Legacy waste removal**
 - Large components; magnets, beam components from 936 and 912
 - Radioactive shield blocks
- **Continue with AGS cable removal**

E. Lessard

- **Summary**
- **Proposed FY08 Objectives and Targets**
- **Senior Manager Evaluation**

Summary of Management Review Presentations

- **Most OSH and E Targets met**
 - **Injuries down**
 - **Pollution prevented**
 - **Legacy materials removed**
- **Working-off facility-related violations (OSHA, ASME, NEC)**
- **Working-off legacy materials inventory**
- **Valuable metals security improved**

Proposed 2008 Objectives That are Based on Internal and External Vetting

- **Greenhouse Gas Emissions**
 - **3% reduction**
- **Unneeded Materials and Chemicals**
 - **3% reduction**
- **Regulatory**
 - **0 Notices of Violation**
 - **0 Permit Exceedances**
- **Safety**
 - **0 Lost Workday Incidence Rate**
 - **0.5 Total Recordable Incidence rate**

2008 Proposed Practices to Support Objectives

- **Increase human performance training**
- **Increase senior manager's work observations**
- **Participate in code training (e.g., ASME/NEC/OSHA)**
- **Charter a Human Performance Improvement Committee**
 - **Committee should review events for organizational deficiencies**
- **Conduct field review of posted operator aids**
- **Conduct review of records, ensure secure and retrievable locations**
- **Train staff in 2008 version of Work Planning Subject Area**
- **Train staff on Environmentally Preferable Purchasing Program**
- **Disposition materials and chemicals in accord with UMC plan**
- **Improve RHIC cryogenics system energy-efficiency**
- **Reduce unnecessary loads to decrease electricity use**

Senior Management Evaluation

- **Purpose: identify improvement actions and assign responsibility and resources to implement**

Management Question 1

- **Are the OSH/EMS/S/SA programs effective in achieving policy commitments?**
 - **Compliance?**
 - **Pollution prevention?**
 - **Injury/illness reduction?**
 - **Community outreach?**
 - **Clean-up?**
 - **Continual improvement?**
 - **Security?**
- **Issues**
 - **Need to continue toward full 10CFR851 compliance (OSHA, electrical...)**
 - **Need to continue groundwater protection and cap Linac beam stops**
 - **Need to continue to improve materials security programs**
 - **Reduce, where appropriate, lead solder, freon, mercury, power use**
 - **Reduce excess space throughout complex**
 - **Need to continue human performance, NEC and ASME training**

Management Question 2

- **Are programs effective in achieving the objectives and measures?**
- **Issues**
 - **Evidence points to successful achievement of most targets; however,**
 - **Continue to identify and fix OSHA and NEC violations**
 - **Continue industrial hygiene baseline monitoring (noise, etc.)**
 - **Complete the arc flash calculation and labeling program**
 - **Continue to improve housekeeping programs**
 - **Continue to improve metals inventory**
 - **Continue to remove aging cable in AGS**
 - **Continue to archive data on activated soils**
 - **Complete the removal PCB capacitors at Linac, B912 and B928 (TVDG?)**
 - **Continue to request BNL to repair Building 912 and 930 roofs**
 - **Continue OHSAS 18001 and ISO 14001 registrations**
 - **Continue to upgrade emergency generators; remove underground tank**

Management Question 3

- **Are the OSH/EMS/S/SA programs adequate in terms of:**
 - **Identifying significant environmental aspects and impacts?**
 - **Identifying significant occupational safety and health hazards?**
 - **Identifying significant security issues?**
 - **Resource allocation?**
 - **Information systems?**
 - **Organizational issues such as expertise or procedures?**
- **Issues**
 - **Need resources for:**
 - **Fire Hazards Analyses recommendations**
 - **Roof repairs**
 - **OSHA violation abatement**
 - **Warehouse 'footprint' reductions and inventory management**
 - **Royal box (old power distribution), cable and tray removals**
 - **Soil capping projects**

Management Question 4

- **Are the objectives and measures suitable in terms of:**
 - **Environmental impacts, occupational hazards, security?**
 - **Concerns of stakeholders?**
 - **Current and future regulatory requirements?**
 - **Business interests?**
 - **Technological capability?**
 - **Internal organizational or process changes?**
 - **Should additional measures be established?**
- **Issues**
 - **Need objectives and targets for ISM concerns (e.g., PPE)**
 - **10CFR835 changes (neutron quality factor; equivalent-dose)**

Management Question 5

- **Recommended revisions to:**
 - **OSH policy and commitments?**
 - **Environmental policy and commitments?**
 - **Self-assessment policy and commitments?**
 - **Objectives and performance measures?**
 - **Elements of OSH, EMS, SA, Security?**
- **Issues**
 - **Lab should implement policies via Interim SBMS not via memo**
 - **Continue the working group approach to changing SBMS**
 - **Need to add senior department-manager oversight committee**
 - **Subject Areas needing BNL work: interlocks, PPE, electrical safety**